

NEW SPECIES OF CONIOPTERYGIDAE (NEUROPTERA) FROM NORTH AMERICA¹

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INTRODUCTION

Six new species of Coniopterygidae are herein described from North America. The descriptions are based primarily on male genitalia, but other characters are given where they appeared to be diagnostic. Specimens in this study were collected by the author (*Coniopteryx delta* and *Semidalis tricornis*) or borrowed from the following collections: Arizona State University (ARIZ), Illinois Natural History Survey (INHS), Pennsylvania State University (PSU) and Utah State University (UTAH). All specimens were examined in glycerine with a dissection microscope and drawings were made freehand with a counting grid in one ocular.

Coniopteryx delta new species

Type: Holotype male; Mexico; USNM.

Head: Brown, eyes dark. Frons and palpi normal. Antennae greyish brown, 24–26 segmented. Scape and pedicel about as long as broad in males and one half times as long as broad in females. No scale-like hairs on flagellar segments (Fig. 1F). Regular hairs about as long as segment is broad, arranged in two regular rows on flagellar segments. Each segment with a slightly curved seta, longer than segment is broad.

Thorax: Brown with dark brown shoulder spots. Membrane of wings greyish brown. Length of fore wing 2.1–2.6 mm, hind wing 1.7–2.1 mm.

Male genitalia (Fig. 1A–E): Hypandrium in lateral view about as high as broad. Apodeme along anterior margin complete. Processus terminales large, truncate, widely separated to form a very wide V-

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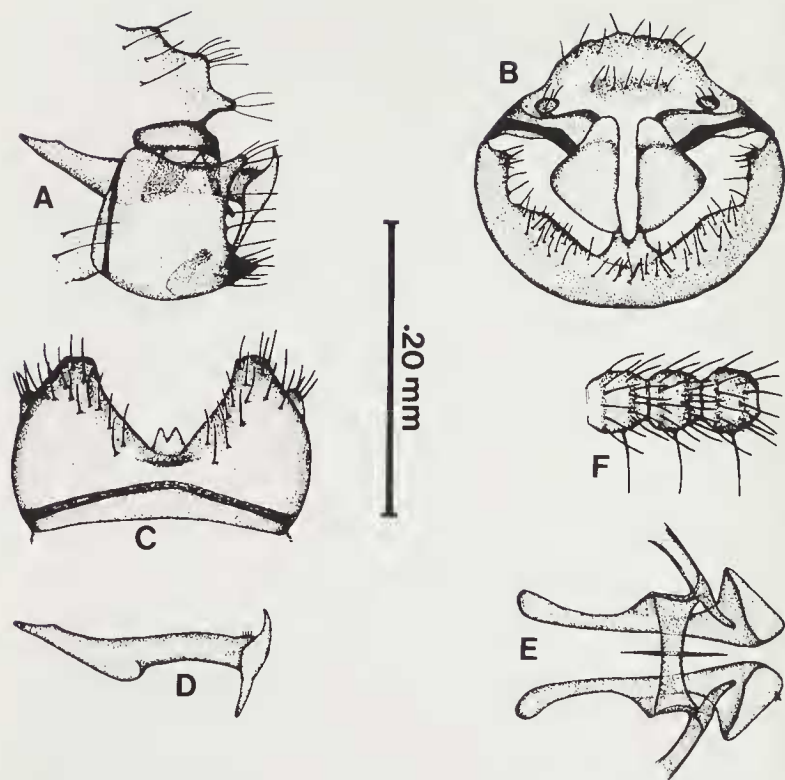


Fig. 1. *Coniopteryx delta*. A. Male genitalia, lateral view. B. Male genitalia, caudal view. C. Hypandrium, ventral view. D. Paramere, lateral view. E. Male internal genitalia, ventral view. F. Male antennal segments 8-10.

shaped median apical incision. Processus laterales prominent. Gonarcus well developed. Hypandrium with an inner, distally bifurcate plate attached to median apical incision. Stylus forked, outer branch bent slightly forward. Inner branch forming an arch below parameres and connected with processus ventrales of parameres. Processus apicalis in lateral view acute and bent slightly forward with a longer acute ventral process. In caudal view, parameres broadly triangular, produced laterally. Penis apparently consisting of one sclerotized rod.

Female genitalia: Gonapophyses laterales sclerotized, separate.

Holotype male: Mexico: Veracruz, Catemaco, III-14-1976, V.

Johnson, sweeping. Paratype: 1 female, same data as holotype. Both specimens deposited in USNM.

Notes: This species belongs to the *C. westwoodi* group. Besides genitalic differences, this species can be separated from related species by the lack of scale-like setae on the flagellar segments, lack of a hook on the frons and the presence of an inner, distally furcate, transverse plate on the hypandrium. No other North American species has this combination of characters.

***Coniopteryx dorsicornis* new species**

Coniopteryx simplicior Meinander (in part), 1972:261. Type: Holotype male; Florida; PSU.

Head: Brown. Frons and palpi normal. Antennae (Fig. 2F) yellowish brown, 29–30 segmented (left antenna with 29 segments with first flagellar segment partially subdivided, right antenna with 30 segments). Scale-like hairs in several whorls on apices of flagellar segments. Basal flagellar segments rounded, about as long as broad. Ordinary hairs on flagellar segments in two whorls, about as long as width of segment. Each segment with a slightly curved seta, slightly longer than width of segment.

Thorax: Brown with dark brown shoulder spots. Membrane of wing yellowish-brown. Length of fore wing 3.0 mm, hind wing 2.6 mm.

Male genitalia (Fig. 2A–E): Hypandrium in lateral view higher than broad, skewed dorso-caudally. Apodeme along anterior margin ventrally interrupted, dorsally continued along dorso-lateral margin of hypandrium for a short distance. Processus terminales acute, median apical incision V-shaped. Processus laterales not prominent. Gonarcus well developed. Hypandrium with a large inner distally bifurcate plate attached to median apical incision. Stylus forked, outer branch bent forwards. Processus ventrales of parameres connected. Processus apicalis long, diverging dorsally, sub-equal to a long ventral process. Penis consisting of two rods, apparently fused caudally.

Holotype male: FLORIDA: Highlands Co., Archbold Biological Station, III-30-IV-5-1967, S. W. Frost. Holotype deposited in museum of Pennsylvania State University.

Notes: This species belong to the *C. westwoodi* group. This specimen was one of a lot identified as *C. simplicior* Meinander by

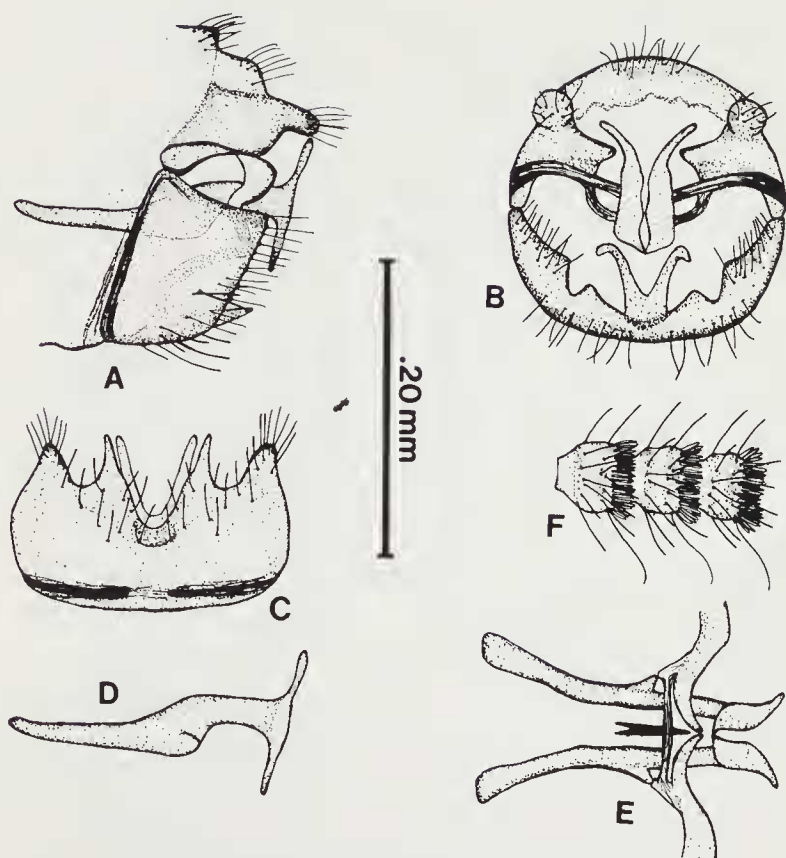


Fig. 2. *Coniopteryx dorsicornis*. A. Male genitalia, lateral view. B. Male genitalia, caudal view. C. Hypandrium, ventral view. D. Paramere, lateral view. E. Internal male genitalia, ventral view. F. Male antennal segments 8-10.

Meinander and according to the International Rules of Zoological Nomenclature is a paratype of *C. simplicior*. *C. dorsicornis* can be easily separated from *C. simplicior* by the long processus apicalis, the ventrally interrupted apodeme along the anterior margin of the hypandrium, the lack of a longitudinal apodeme connected to bottom of median apical incision and by the more developed gonarcus.

***Coniopteryx forcipata* new species**

Type: Holotype male; Arizona; USNM.

Head: Yellow. Frons and palpi normal. Antennae (Fig. 3F) brown, 22-25 segmented. Flagellar segments wider than long, especially proximal ones which are much wider than long, disc-like. Median and distal flagellar segments gradually becoming longer until almost as long as wide. Ordinary hairs in two irregular rows. Seta present and scale-like hairs present on apical ends.

Thorax: Yellowish with brown shoulder spots. Wing membrane greyish. Length of fore wing 2.0-3.2 mm, hind wing 1.7-2.6 mm.

Male genitalia (Fig. 3A-E): Hypandrium in lateral view about as

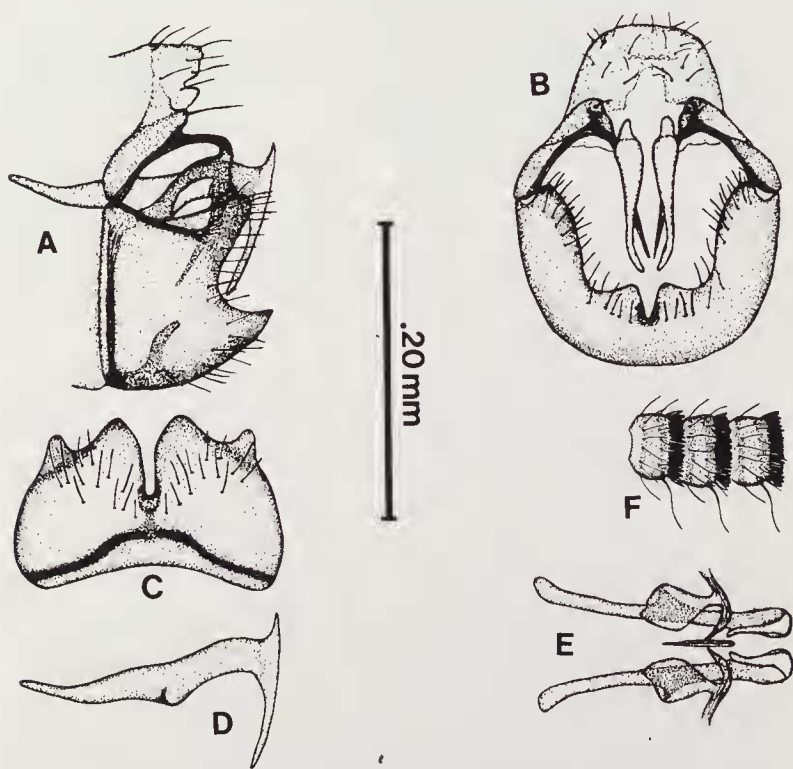


Fig. 3. *Coniopteryx forcipata*. A. Male genitalia, lateral view. B. Male genitalia, caudal view. C. Hypandrium, ventral view. D. Paramere, lateral view. E. Male internal genitalia, ventral view. F. Male antennal segments 8-10.

high as broad. Apodeme along anterior margin ventrally complete. Median apical incision deep, narrow and parallel-sided. Processus terminales prominent, rounded. Processus laterales prominent, digit-like. Hypandrium with a small, inner, distally bifurcate, transverse plate on median apical incision. Gonarcus rather small. Styli forked, inner branches extending forward, not connected to each other. Processus apicalis acute with a very long ventral process. Ventral process at least twice length of processus apicalis. In caudal view, parameres appearing caliper-like with long narrow ventral process curving slightly medially at apical ends. Penis formed of two small rods.

Holotype male: ARIZONA: Cochise Stronghold, Dragoon Mts., VI-20-24-1970, R. J. Shaw, blacklight trap.

Paratypes: ARIZONA: Pinal Co., Superior, 1 male, V-28-1946, B. W. Benson, at light; 1 male, V-17-24-1946, B. W. Benson, at light; 2 males, IV-21-1949, B. W. Benson, at light; 1 male, H. K. Gloyd, at light; Cochise Stronghold, Dragoon Mts., 13 males, R. J. Shaw, blacklight trap, following dates: 2 males VIII-12-15-1969; 1 male, V-12-17-1970; 1 male, VI-20-24-1970; 4 males, VI-27-29-1970; 1 male, VII-15-18-1970; 2 males, VII-24-27-1970; 1 male, IX-4-9-1970; 1 male, IX-21-28-1970. Deposited in ARIZ, INHS, USNM and collection of the author.

Notes: This species belongs to the *C. westwoodi* group. *C. forcipata* is similar to *C. dorsicornis* but differs in the shape of the hypandrium and parameres. In addition, the inner branches of the styli in *C. dorsicornis* are connected, forming an arch below the parameres; while in *C. forcipata* the inner branches are not connected.

Coniopteryx meinanderi new species

Type: Holotype male; Arizona; USNM.

Head: Brown, frons and palpi normal. Antennae (Fig. 4F) dark brown, 34-27 segmented. Flagellar segments about as long as broad to about one and one half times as long as broad. Ordinary hairs in two irregular whorls. Plate-like hairs absent. Seta present.

Thorax: Brown with dark brown shoulder spots. Wings with membrane brown. Length of fore wing 2.2-3.4 mm, hind wing 2.2-3.0 mm.

Male genitalia (Fig. 4A-E): Hypandrium in lateral view sub-triangular, much wider ventrally than dorsally. Apodeme along

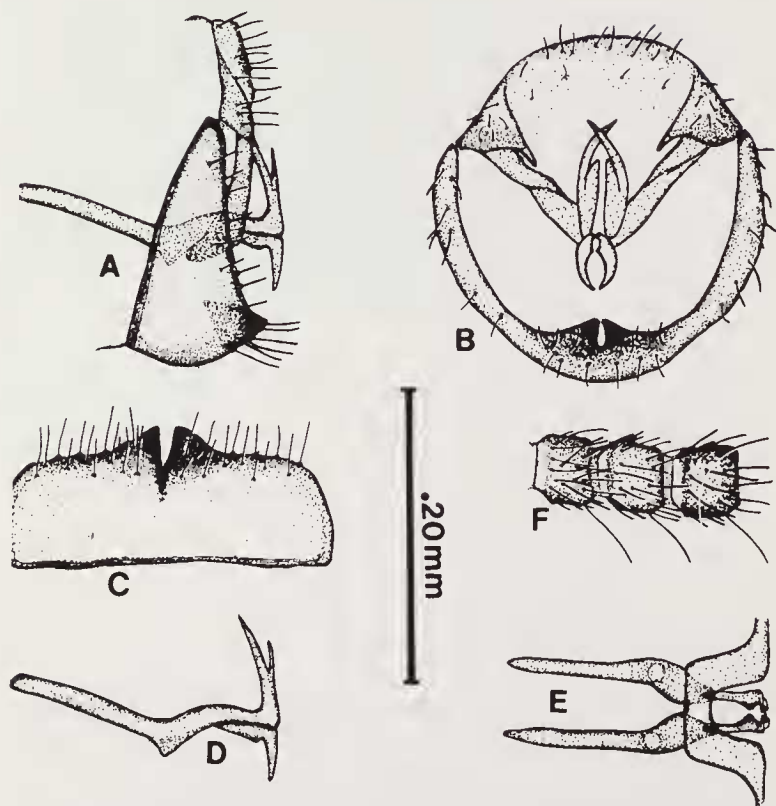


Fig. 4. *Coniopteryx meinanderi*. A. Male genitalia, lateral view. B. Male genitalia, caudal view. C. Hypandrium, ventral view. D. Paramere, lateral view. E. Male internal genitalia, ventral view. F. Male antennal segments 8-10.

anterior margin ventrally complete. Processus terminales short, acute. Processus laterales absent. Median apical incision slit-like, margins heavily sclerotized. Hypandrium with an inner, triangular extension (in lateral view) from median apical incision. Gonarcus small, terminating in a tooth. Styli originating about midway on gonarcus, band-like, forming an arch below parameres. Parameres elbowed at processus ventrales. Processus apicalis bifurcate, inner branch short, straight; outer branch longer, curved medially. Penis consisting of two rods, apical halves of which are curved downward at almost right angle. In caudal view, penis looks pincer-like.

Female genitalia: Gonapophyses laterales fused, forming a heavily sclerotized transverse plate.

Holotype male: ARIZONA: Cochise Stronghold, Dragoon Mts., R. J. Shaw, blacklight trap. Paratypes: ARIZONA: Pinal Co., Superior, 1 male, V-2-8-1946, B. W. Benson, light trap; 1 male, V-17-24-1949, B. W. Benson, light trap; 5 males, VII-16-VIII-5-1948, H. K. Gloyd, at light; Doscabezas, 1 male, VII-24-26-1970, S. Kozloski, U.V.; Cochise Stronghold, Dragoon Mts., R. J. Shaw, blacklight trap, 650 males 500 females at various dates from VIII-14-1969 to X-7-1970. Deposited in ARIZ, INHS, USNM and collection of the author.

Notes: This species belongs to the *C. diversicornis* group. *C. meinanderi* is similar to *C. texana* Meinander and *C. diversicornis* Meinander but differs in the shape of the caudal incision of the hypandrium. The caudal incision is narrow and slit-like in *C. meinanderi* and rounded in the other two species.

This species is dedicated to Dr. Martin Meinander.

***Coniopteryx quadricephala* new species**

Type: Holotype male; Utah; USNM.

Head (Fig. 5A-B): Brown. Frons unsclerotized except for a median vertical band with four large stiff setae at the ventral end. Below it a large curved hook. Hook laterally expanded, somewhat flattened until just before tip where it becomes more rounded, narrower. Hook almost forms a circle, with the tip close to the base. Inner curve of hook with many large, stiff setae; a large patch at base, one or two about one third of length of hook from base, and a small patch about one third the length of hook from the end. All setae converge in center of hook. Vertex of head produced anteriorly to form a large shelf-like area, flat on top and square when viewed dorsally. Antennae (Fig. 5A-B and Fig. 6F) brown, 24-26 segmented. Scape and pedicel longer than broad. First flagellar segment partially subdivided with two stiff setae on dorsal side close to proximal end. Most distal of these two setae with terminal one third curved proximally. Remaining flagellar segments with a smaller, stiff, straight seta; one distally slightly curved setae present. Flagellar segments with regular hairs in two regular whorls and with scale-like hairs at apices. Maxillary palpi with fourth segment greatly enlarged, hatchet-shaped with a small area covered with short sensory hairs.

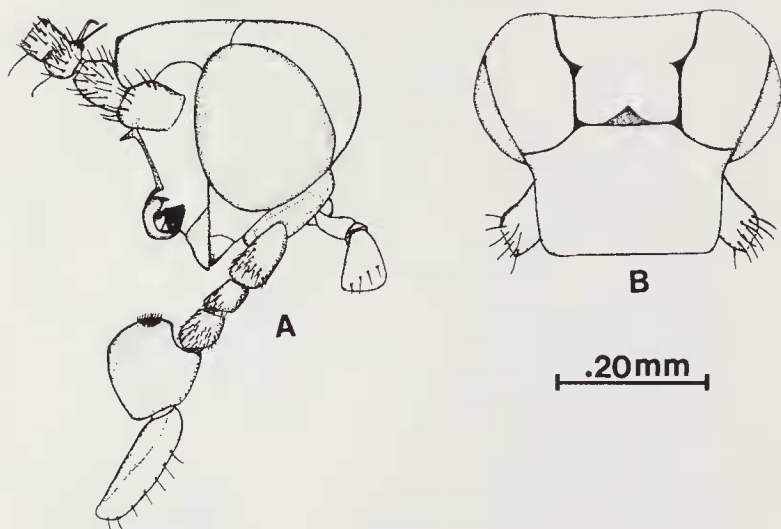


Fig. 5. *Coniopteryx quadricephala*. A. Male head, lateral view. B. Male head, dorsal view.

Remaining segments of maxillary and labial palpi normal.

Thorax: Brown with dark brown shoulder spots. Membrane of wings light greyish brown. Length of fore wing 3.4–4.0 mm, hind wing 2.6–3.0 mm.

Male genitalia (Fig. 6A–E): Hypandrium in lateral view about as high as broad. Apodeme along anterior margin ventrally complete, dorsally extending for a short distance along hypandrium margin. Median apical incision fairly shallow, V-shaped. Processus terminales acute. Processus laterales prominent. Hypandrium with an inner, distally bifurcate plate attached to median apical incision. Gonarcus broad. Styli forked at base. Inner branches membranous, fused together below parameres, attached to processus ventrales, outer branches short. Processus apicalis rounded in caudal view with a somewhat longer ventral process, truncate and parallel sided in caudal view. Penis formed of two small rods.

Holotype Male: UTAH: Cache Co., Green Canyon, VII-25-30-1968, W. J. Hanson, malaise trap. Paratypes: Cache Co., Green Canyon, 2 males, VII-25-30-1968, W. J. Hanson, malaise trap; 1 male, VII-27-VIII-2-1968, W. J. Hanson, malaise trap; 1 male, VI-28-1969, malaise trap; 2 males, VII-4-1969, W. J. Hanson, malaise trap.

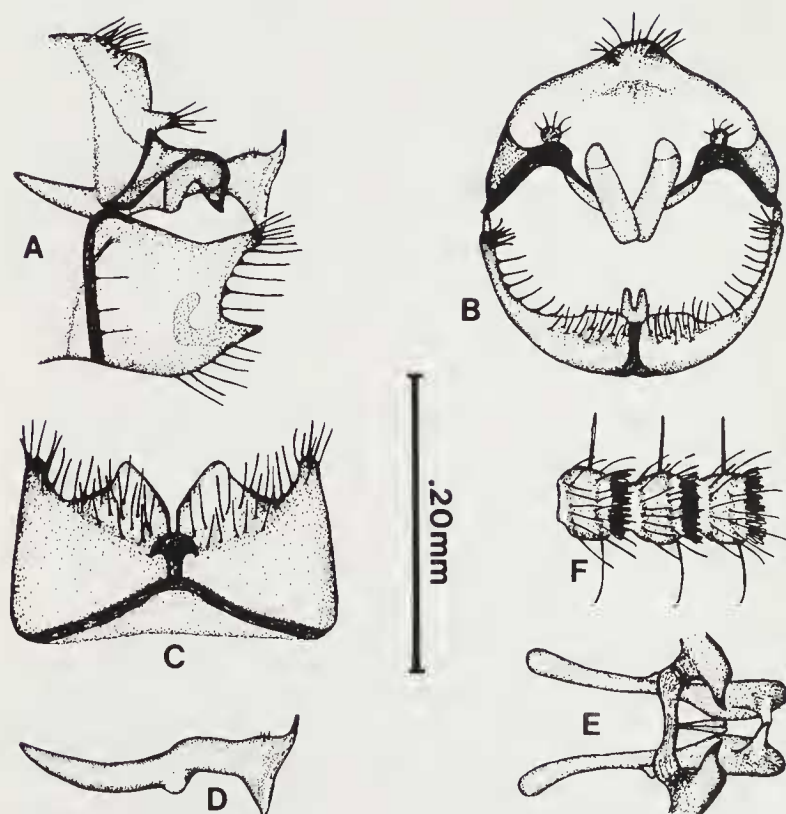


Fig. 6. *Coniopteryx quadricephala*. A. Male genitalia, lateral view. B. Male genitalia, caudal view. C. Hypandrium, ventral view. D. Paramere, lateral view. E. Male internal genitalia, ventral view. F. Male antennal segments 8-10.

Deposited in USNM, UTAH and collection of the author.

Notes: This species belongs to the *C. westwoodi* group. *C. quadricephala* can be separated from all related species by the shape of the head. No related species has the vertex of the head produced as previously described and figured.

Semidalis tricornis new species

Type: Holotype male; Arizona; USNM.

Head: Light reddish tan. Antennae yellowish grey, 29-33 seg-

mented. Flagellar segments slightly longer than broad.

Thorax: Light yellowish grey with greyish brown shoulder spots. Membrane of wings light fuscous. Length of fore wing 3.0–3.5 mm, hind wing 2.4–3.8 mm.

Male genitalia (Fig. 7): Outer process of ectoprocts rather short,

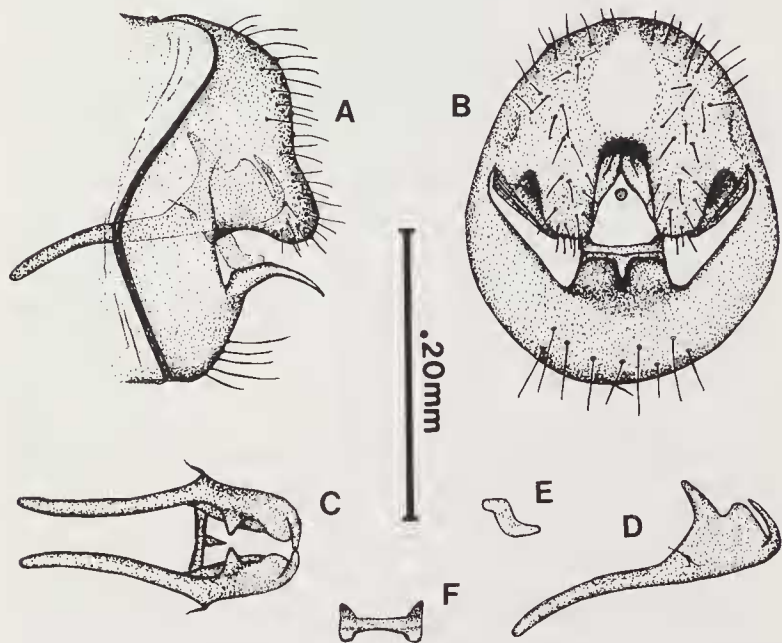


Fig. 7. *Semidalis tricornis*. A. Male genitalia, lateral view. B. Male genitalia, caudal view. C. Male internal genitalia. D. Paramere, lateral view. E. Uncini, lateral view. F. Uncini, caudal view.

stout. Process at inner angle of ectoprocts small, triangular. Hypanthium dorsally terminating in a long spine, slightly curved ventrad. Parameres apically swollen with a deep dorsal incision formed by body of paramere and dorsally directed spine terminally. A large dorsally directed spine in middle, curving medially and slightly anteriorly. Anterior to large spine a small process originating on lateral side of paramere and projecting forward. Uncini fused into a transverse plate, in caudal view with broad dorsal and ventral incisions.

Holotype male: ARIZONA: Cochise Stronghold, Dragoon Mts., R. J. Shaw, blacklight trap; Paratypes: Cochise Stronghold, 1 male, IX-11-15-1969; 1 male, VI-27-29-1970; 1 male, VII-24-27-1970; MEXICO; OAXACA; 0.5 mi. S. of Llano Verde, 1 male, III-21-1976, V. Johnson. Deposited in USNM and the collection of the author.

Notes: This species belongs to the *S. vicina* group. Genitally, *S. tricornis* is similar to *S. arnaudi* Meinander, but differs in the shape of the parameres. The terminal spine is longer in *S. tricornis* and the dorsal incision is much deeper and narrower. In addition, the central spine of *S. tricornis* is directed dorsally rather than forwards and is closer to the caudal end.

The Mexican specimen is much larger than the Arizona specimens. The Arizona specimens have wing spans of 3.0–3.2 mm fore wing, 2.4–2.6 mm hind wing, and have 29–30 antennal segments (the holotype has right antennae with 29 segments and left with 30); the Mexican specimen has wing span of 4.5 mm fore wing, 3.8 mm hind wing and has 33 antennal segments.

REFERENCE CITED

MEINANDER, M.

- 1972 A revision of the family Coniopterygidae (Planipennia). Acta Zool. Fennica 136:1–357.